



# Turfgrass

NORTH CAROLINA

May/June 2007

A Publication of the Turfgrass Council of North Carolina

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ON BASICS



# NCDA&CS Field Services — Solving Problems with Soil Fertility and Plant Nutrients

By Catherine Stokes, NCDA&CS Agronomic Division

**K**eeping golf-course turf attractive and functional 365 days a year can be a daunting task in North Carolina. The survival of niche grasses planted in constructed landscapes is routinely jeopardized by temperature fluctuations, excess rainfall, drought or storms. Fortunately, the negative effects of weather can often be moderated by appropriate adjustments to routine fertilization. For help with this task, turf professionals have access to an invaluable resource — the Agronomic Division of the NC Department of Agriculture and Consumer Services.

The Agronomic Division is known statewide as the agency responsible for soil-testing and other laboratory analyses. Fewer people know that the Division has a Field Services Section with 13 regional agronomists on call throughout the state to provide advice on soil fertility and plant nutrition (see sidebar on page 32). These experts are available to make site visits, evaluate problem situations, suggest sampling strategies and formulate solutions. They comprise one of the most accessible and cost-effective resources available to turf managers.

For many superintendents, like Chad Matthews of Lane Tree Golf Club in Goldsboro, consulting a regional agronomist has become a routine component of his turf-management strategy. Matthews' collaboration with NCDA&CS began in August 2005 when one of the bentgrass greens at Lane Tree became dotted with dry, brown patches (see Photo 1). Drought and summer heat were obvious sources of concern. The age of the course was another. Some of the greens were nearly 15 years old.

"That year, lots of courses had similar problems," said Matthews. "We were coming off two years of

record rainfall and high temperatures. Personally, I didn't think it was a nutrient issue at the time. I thought it was a watering problem."

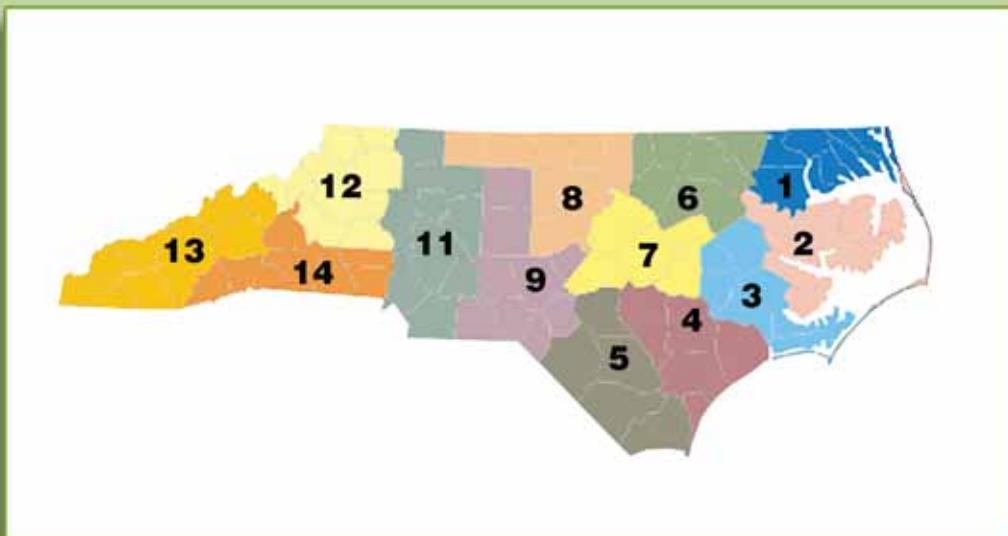
When Matthews sent soil samples to the NCDA&CS laboratory in Raleigh, test results indicated low soil pH values and potassium levels. Potassium was almost nonexistent in the worst places. Comments on the soil-test report urged him to contact his regional agronomist, Don Nicholson, for advice.

When Nicholson came out to Lane Tree for a site visit, Matthews was well into problem-solving mode. He already had soil-test and nematode-assay reports in hand. Nicholson went over the agronomic test results with him, helped rule out a disease or nematode problem and then focused in on the soil pH and potassium issues.

"Summer is tough on bentgrass in this part of the world," said Nicholson. "Growing it is a delicate balancing act. It requires close monitoring of soil-fertility and plant-nutrient status. Soil tests and tissue



Photo 1. Lane Tree's problem bentgrass green in August 2005.



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\* Region 10 no longer exists.



tests are the best indicators. Who puts oil in a truck without first checking to see if it is low? You've got to check."

Although bentgrass is hard to grow in North Carolina, it can stay green about 10 months out of the year with intensive management. The best approach is to try to maximize root growth in the spring so that, by summer, the roots will have penetrated deep enough to sustain the green through the hot, dry months. This means spoon-feeding with nutrients and irrigating as little as possible — the goal being to wait until the grass "needs" water.

Maintaining this balance is like walking a tightrope, however, and decline can occur rapidly. Abundant rainfall at Lane Tree in the spring of 2005 favored shallow root development. As temperatures increased that summer, the root system was not able to access sufficient water from the soil profile. Because fertilizer nutrients had already been leached out of the rootzone, patches of grass began to die from drought and starvation.

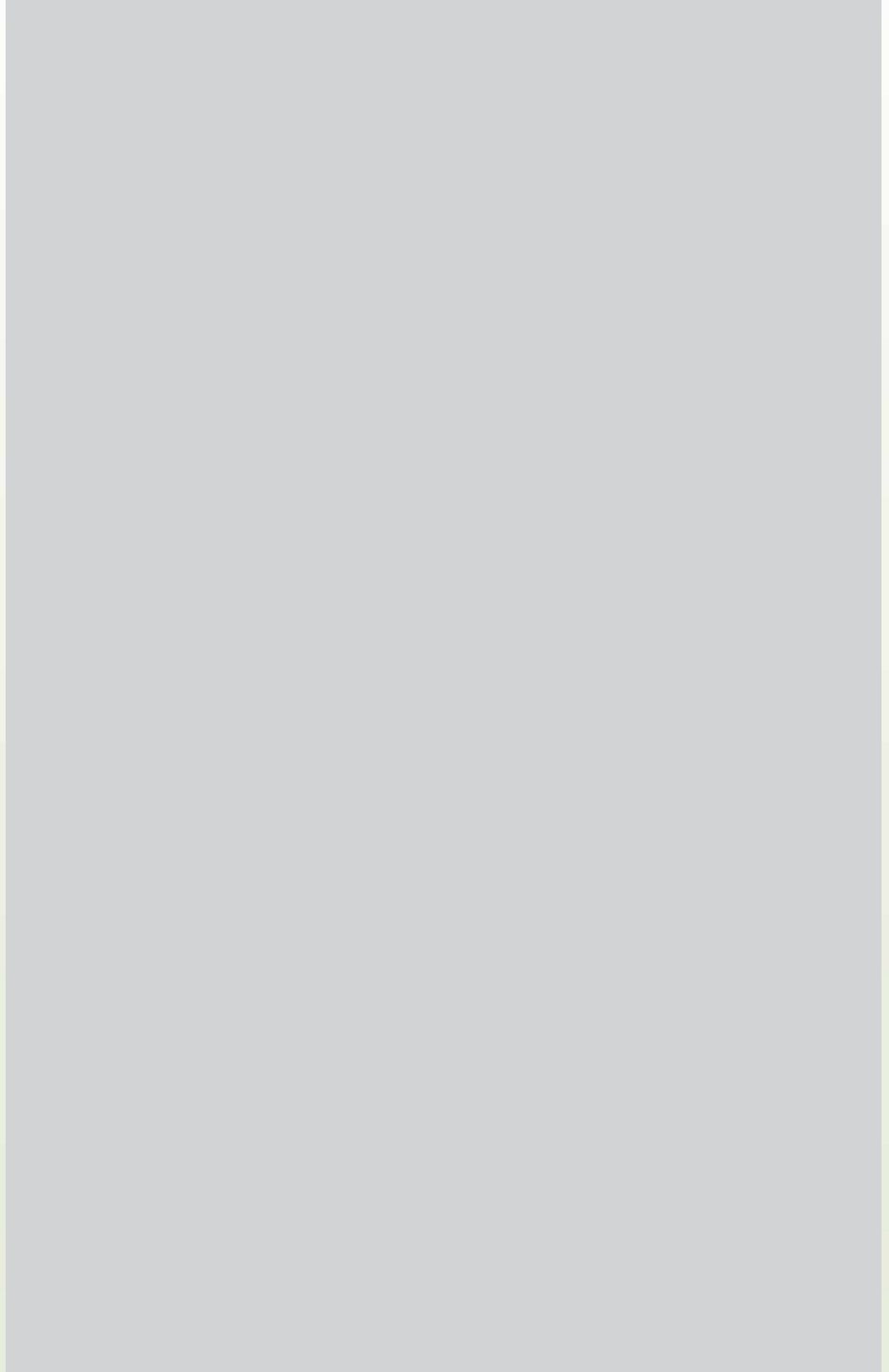
Matthews' original gut feeling turned out to be close to the truth. The problem, even though it was a nutrient issue, had been triggered by too much water early in the growing season. If he had been tissue sampling routinely throughout the spring, he would have had been alerted to the problem before it became so far advanced.

Even under seemingly optimal conditions, monitoring is important because setbacks can occur rapidly. A root system 6" to 7" deep can die back to 1/2" within a week. Regular monitoring — at least every two weeks during the growing season — is the best way to manage bentgrass and stay on top of important changes. Plant-tissue analysis provides information that mere visual observation cannot.

Tissue analysis is a great monitoring tool because it can detect nutrient problems before symptoms become apparent. That gives managers the advance notice they need to address the situation appropriately. By adjusting fertilizer applications in accordance with a known current need, superintendents can usually avert or minimize most nutrient problems.

Matthews knows this only too well. "I could have a guy sitting on a stool at every green watching it, and it could still go bad," he said. "I know how useful agronomic tests are, but I also know that it's much easier to maintain a good monitoring program with someone to guide me and keep me on the right track. That's the advantage of working with a regional agronomist."

In 2006, Matthews and Nicholson worked together to dramatically improve Lane Tree's bentgrass greens (see Photo 3). Following Nicholson's advice, Matthews applied potassium in a highly water-soluble form and raised the soil pH to 6.2. He also collected soil and plant-tissue samples on a regular basis to monitor progress. Under this regime, the greens were quickly restored.



# green light

## ON BASICS

continued

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“Every problem I encounter changes how I sample the course in the future,” said Matthews. “Through working with Don, I know now that I should take more tissue samples in the summer during the stress period. By getting soil sample results in September, I can plan ahead to have soil pH where I want it by the following March. From spring on, I will collect tissue samples every two weeks.”

NCDA&CS recommends collecting routine soil samples from fairways early every fall. Greens should be sampled twice each year — once in the fall and again in late spring or early summer before temperatures peak. If problems develop, additional sampling may be necessary.

If you would like assistance from your NCDA&CS regional agronomist, call and schedule a meeting. He or she will visit your site, identify and evaluate nutrient-related problems, recommend specific sampling strategies and work with you to develop an effective management plan. Nutrient-related issues include, but are not limited to, lime and fertilizer needs, poor growth, plant-parasitic nematode damage, clogged irrigation systems, solubility problems with nutrient solutions, discolored leaves and suitability of soil amendments.

Visit [www.ncagr.com/agronomi/](http://www.ncagr.com/agronomi/) for additional information or call the division office at (919) 733-2655. ☎



Photo 2. NCDA&CS regional agronomist Don Nicholson (left) and Lane Tree superintendent Chad Matthews collect a soil sample from the same green in September 2006.